UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan International Institute of Technology (MJIIT)

Bachelor of Software Engineering

Session 2024/2025 Semester 1

SECR 1213 Network Communication

Section - 16

Lecturer: Dr. Kaiyisah Hanis Mohd Azmi

Task-3

Submitted by:

Group G

Liu Wanpeng(A23MJ4016)

Zhao Wei (A23MJ4018)

Thamer Alharbi (A23MJ4015)

Date of Submission: November 27, 2024

Catalogue

1. Meeting Five

MEETING MINUTES

DATE/TIME	*November 22, 2024 6:00 PM*	
LOCATION	*Zoom Virtual Meeting*	
AGENDA	*1. Overview of the Feasibility Analysis Report* *2. Discussion on Key Budget and Technical Feasibility* *3. Risk Assessment and Mitigation Strategies* *4. Task Allocation and Timelin*	
Meeting MC	*Liu Wanpeng*	
ATTENDANCE		
NAME	**TIME**	**REASON FOR ABSENCE**
Liu Wanpeng	*06:00*	
Zhao Wei	*06:01*	
Thamer Alharbi	*06:06*	

MINUTES			
NO.	**ITEM DISCUSSED**	**IDEAS/SUGGESTIONS AND PERSON GIVING IT**	**PERSON IN CHARGE & DATE**
1	*Overview of the Feasibility Analysis Report*	*Zhao Wei suggested potential optimizations for the core hardware selection (e.g., Cisco ISR 4000 routers).*	*Zhao (26/11)*
2	*Discussion on Key Budget and Technical Feasibility*	*Liu Wanpeng emphasized the importance of hardware allocation, which constitutes 50.5% of the total budget.*	*Liu (25/11)*
3	*Risk Assessment and Mitigation Strategies*	*Thamer recommended strengthening the management of the contingency fund (70,000 RM) to*	*Thamer (26/11)*

		address market price fluctuations.	
4	*Meeting ended*	*7:10 PM*	

2. Member Rating

Liu Wanpeng

No.	Scoring Criteria	Score (1-5)
1	Host's Performance	5
2	Clarity of Agenda	4
3	Team Participation	4.5
4	Decision-Making Efficiency	4.5
5	Task Allocation	5
6	Overall score	5

Zhao Wei

No.	Scoring Criteria	Score (1-5)
1	Host's Performance	4
2	Clarity of Agenda	4.5
3	Team Participation	4.5
4	Decision-Making Efficiency	4
5	Task Allocation	5
6	Overall score	5

Thamer Alharbi

No.	Scoring Criteria	Score (1-5)
1	Host's Performance	4.5
2	Clarity of Agenda	4

3	Team Participation	4
4	Decision-Making Efficiency	5
5	Task Allocation	4
6	Overall score	4.5

3. Device List

Core Router:

Equipment: Cisco ISR 4000 series or similar.

Unit price: RM 25,000; Total 4 units = RM 100,000.

Purpose: To realize efficient routing between floors, support VLAN segmentation and WAN optimization, and adapt to the complex data traffic and communication needs of universities.

Reason: The core router ensures efficient data flow management in UTM campus, supports the transmission of high-density data traffic, and is an important part of supporting multi-floor networks.

Stacked Gigabit switch:

Equipment: Cisco Catalyst 9200 series or similar.

Unit price: 12,000 RM; Total 20 units = RM 240,000.

Purpose: Provides high-speed connectivity for each floor and network redundancy through stacking, ensuring the stability and scalability of the university network.

Reason: Gigabit switches are the core of a university's network infrastructure, especially in high-traffic classrooms, LABS, and research areas, ensuring network performance.

Wi-fi 6 Access Points:

Device: Cisco Catalyst 9100 Access Points

Unit price: RM 5,500; Total 30 units = RM 165,000.

Purpose: High-speed, reliable wireless connectivity for students, faculty, and visitors.

Reason: Wi-Fi 6 access points support high density of concurrent users and fast data transfer, suitable for UTM classrooms, and public areas.

Web Server and Storage:

Device: Cisco UCS C240 M5 Rack Server

Cost: RM 350,000.

Purpose: Centralized management of network data, support UTM multi-floor core data storage and management.

Rationale: Centralized data management supports UTM's research activities, student data storage, and efficient operation of campus management systems.

Backup system:

Devices: Synology NAS and cloud backup services (e.g. AWS, Microsoft Azure).

Cost: RM 100,000.

Purpose: To ensure local and off-site backup of campus data in case of data loss and disaster recovery.

Reason: Data backup systems reduce the risk of data loss and ensure the long-term security and availability of UTM data, especially in educational and research environments.

Total hardware cost estimate: RM 955,000.

Network infrastructure costs

The cost covers cabling, installation and implementation of security systems to ensure that the network infrastructure meets UTM campus needs.

Fiber optic wiring:

Device: OM4 Optical fiber cable.

Cost: RM 200,000.

Purpose: High-speed backbone connectivity for multiple floors and LABS on campus, supporting traffic up to 10 Gbps.

Reason: Fiber connectivity is an important guarantee for high bandwidth and low latency, which is especially suitable for large educational institutions such as UTM.

Cat6 Wiring:

Equipment: Cat6 cable and RJ45 connector.

Cost: RM 150,000.

Purpose: Support gigabit network connection inside each floor, provide stable LAN service for laboratory and classroom.

Reason: Cat6 cable supports long-term network expansion and is particularly suitable for later upgrades to higher bandwidth requirements.

Network installation and setup:

Labor and setup: Reduce costs and ensure quality project implementation through local network integrators.

Cost: RM 180,000.

Purpose: Covers installation, configuration and integration of all network hardware to ensure smooth project delivery.

Reason: The project requires professional network installation to ensure the performance and stability of the network system.

Network security System:

Equipment: Cisco ASA 5500-X with FirePOWER Services

Cost: RM 40,000.

Purpose: Provides powerful security protection for UTM networks, including threat detection, data protection, and real-time defense mechanism.

Reason: With the increase of campus network users, a strong network security system is a necessary guarantee for UTM campus data and network security.

Estimated total infrastructure cost: RM 570,000.

Software and management tools

Management tools are used to improve network monitoring, security, and automated processing.

Network Management Software:

Device: SolarWinds NPM or PRTG Network Monitor.

Cost: RM 100,000.

Purpose: Provides centralized network management and real-time performance monitoring for large network environments on UTM campuses.

Reason: Effective network management tools help UTM's IT team manage networks across the campus more efficiently.

AI Monitoring Tools:

Device: Darktrace or similar AI solution.

Cost: RM 80,000.

Purpose: To provide AI-driven threat detection and automatic response for UTM's network.

Reason: AI monitoring tools detect complex security threats and ensure UTM networks are protected without interruption.

Estimated total software cost: RM 180,000.

Compliance and licensing fees

Compliance measures ensure compliance with relevant education and data protection legislation.

Regulatory compliance:

Purpose: Ensuring UTM network compliance with GDPR, Malaysian Data Protection Act and other international regulations.

Cost: RM 50,000.

Reason: Compliance with regulations is not only a requirement for data security, it also helps reduce legal risks.

License fee:

Purpose: Cover the legal license of software and hardware to ensure seamless operation.

Cost: RM 40,000.

Reason: Ensure licensing compliance and avoid future legal issues and potential fines.

Estimated total cost of compliance: RM 90,000.

Total cost estimation

Hardware cost: RM 955,000

Infrastructure cost: RM 570,000

Software cost: RM 180,000

Compliance and licensing fee: RM 90,000

Emergency fund: RM 70,000

Total: RM 1,865,000

4. Device Comparsion

Core Router:

Cisco ISR 4000 Series:

Features: Provides highly integrated network services, as well as excellent data processing capabilities.

Price: Relatively high, but thanks to its extensive technical support and corporate trust.

Juniper SRX Series:

Features: Emphasize security functions, provide high-performance firewall and defense capabilities.

Price: Usually slightly cheaper than Cisco, cost-effective.

Stacked Gigabit switch:

Cisco Catalyst 9200 Series:

Features: Network functionality and security, especially in automation and advanced monitoring functions.

Price: Price may be higher due to rich features.

Huawei S5720-SI Series:

Features: Provides basic to medium level network functionality with an emphasis on cost effectiveness and basic performance.

Price: Suitable for customers who have limited budgets but need stable and reliable switches.

Wi-Fi 6 Access Points:

Cisco Catalyst 9100 Access Points:

Features: Provides advanced analytics and security features, such as real-time spectrum analysis and encrypted traffic analysis.

Price: The high price reflects its high-end features designed for enterprise-class environments.

Huawei AirEngine Wi-Fi 6:

Features: Emphasis on seamless roaming and stable connectivity in complex wireless environments.

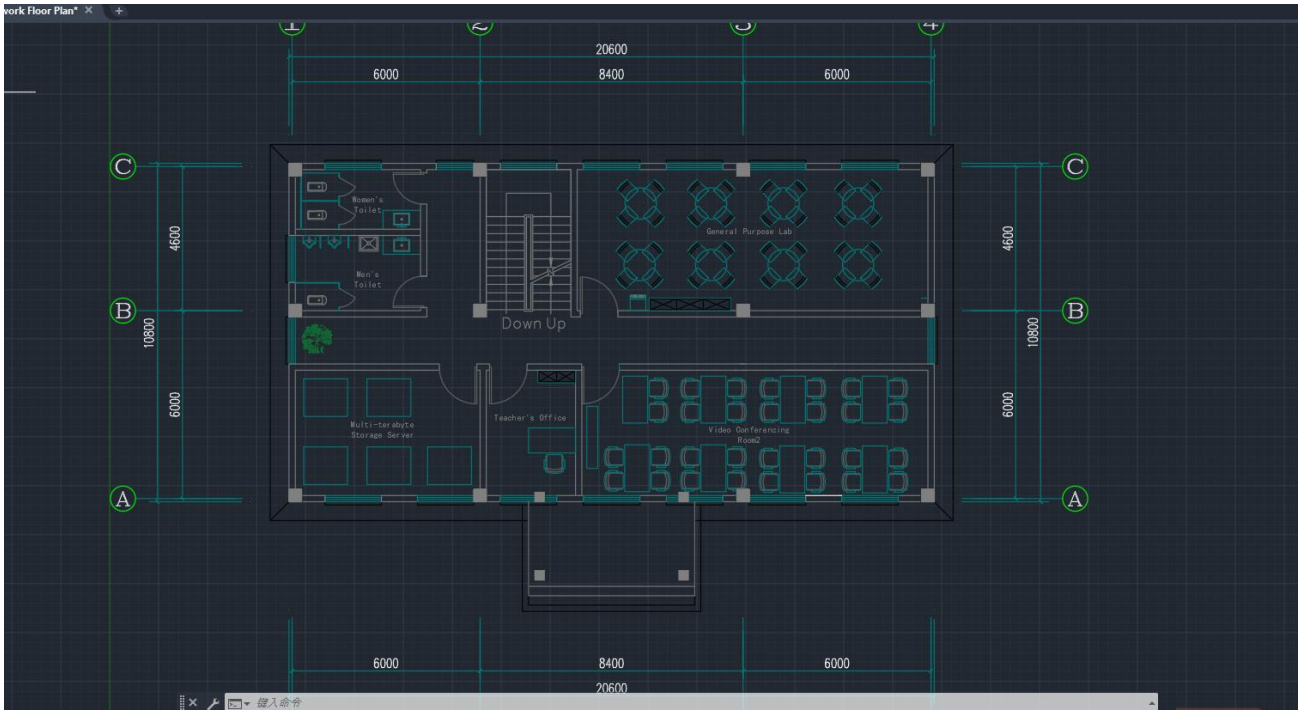
Price: Usually slightly cheaper and more cost effective than Cisco.

5. Summarize

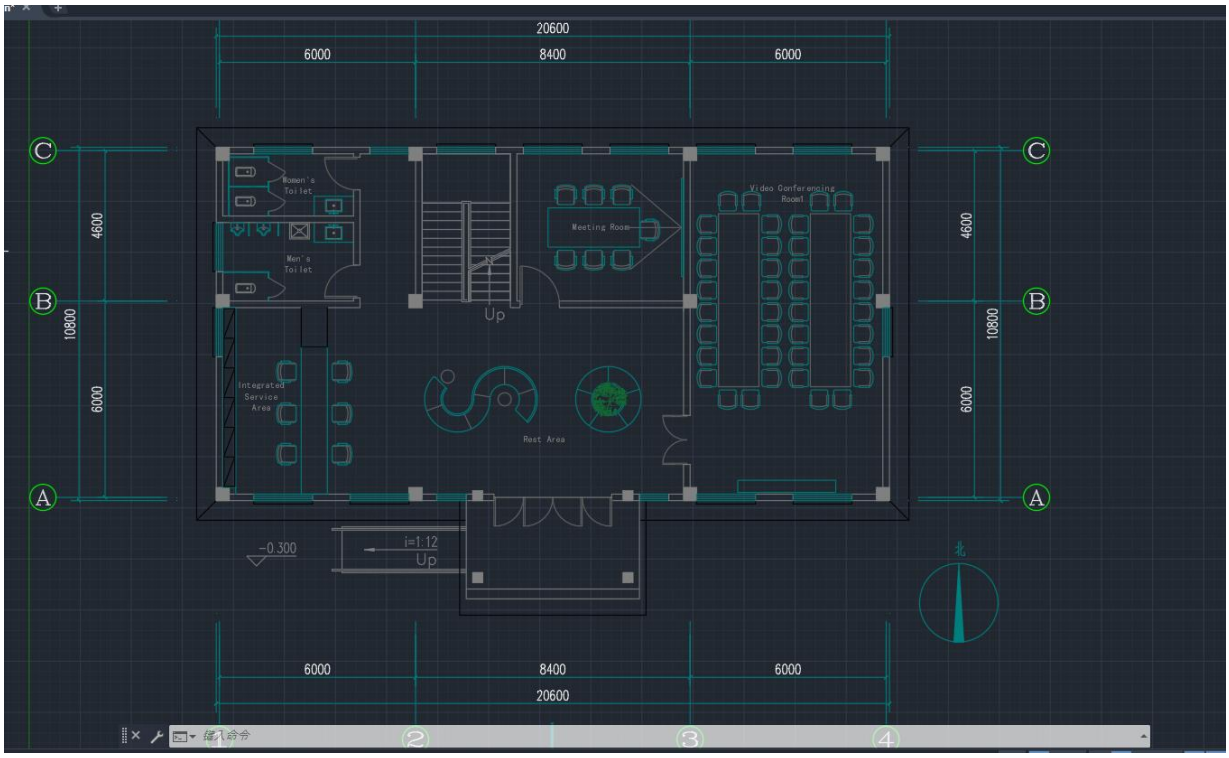
In SUMMARY: I am very surprised at the cost of the equipment, any one equipment needs thousands of prices, but based on the analysis of market equipment prices, the prices of these equipment and services are reasonable in the market, and their functions and performance fully meet our needs. In short, this network equipment will help ensure the stable, safe and efficient operation of the campus network. It's worth it in the long run.

6. Floor plan overview

7.1 Second floor



7.2 First floor



7.3 Third floor